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Of Attorneys for Plaintiffs

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF OREGON

PORTLAND DIVISION

Rocky Bixby, et al,

Plaintiff,

vs.

KBR Inc., et al,

Defendant.

Case No. 3:09-CV-632-PK

**PLAINTIFFS' OPPOSITION TO KBR'S
MOTION TO EXCLUDE DR. ARCH
CARSON'S TESTIMONY RE: GENETIC
TRANSFORMATION INJURY, REMOTE
EXPOSURE INJURY AND MEDICAL
MONITORING
ORAL ARGUMENT REQUESTED**

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I. INTRODUCTION

Defendants contend the testimony of Arch Carson, M.D., toxicologist and occupational medicine doctor, will not assist the jury in understanding how exposure to hexavalent chromium at Qarmat Ali injured the Plaintiffs ("veterans"). Dr. Carson's testimony is admissible because it is both relevant and reliable under the standards set by the United States Supreme Court. *See Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786 (1993). Dr. Carson's expert testimony is also necessary because without it the jury will not be able to understand that sodium dichromate is a well-studied, recognized toxin that causes acute and chronic injuries as well as cancer. Only experts who understand toxicity and health effects can explain the injuries suffered by the veterans. Dr. Carson's testimony is not only helpful—it is essential.

II. SUMMARY OF UNDISPUTED FACTS

Before addressing KBR's individual contentions, a review of undisputed facts and conclusions is helpful. There is no dispute that when the veterans worked at the Qarmat Ali water treatment plant, hundreds of bags of sodium dichromate littered the area. Ex. 1 Inspector General United States Department of Defense, *Exposure to Sodium Dichromate at Qarmat Ali: 2003 Part II-Evaluation of Army and Contractor Actions Related to Hazardous Industrial Exposure* (Sept. 28, 2011) ("DODIG") p. 5; See also, Ex. 2 Kimbro email June 21, 2003). Sodium dichromate was "within and on the soils surrounding the sodium dichromate mixing and storage area." Ex. 3 ("CHPPHM"), p. MCM03639. "Looting at the site" lead to ripping of the bags, which "further spread the contamination." Eventually KBR sampled the soils and "reported concentrations as high as 6,500 mg/kg of hexavalent chromium." Ex. 3 CHPPHM, p. MCM03640. Hexavalent chromium is a toxic form of chromium, also called Cr(VI), which is

found in sodium dichromate. The Army was not able to sample the soils until after KBR had asphalted over the site, and did not take sufficient soil samples for later analysis. Ex. 3 CHPPHM, p. MCM03654). In an attempt to approximate on-site contamination, the Army sampled soils at the fence-line, meaning that the contamination sampled was that which had blown off the Qarmat Ali property. The highest concentration of chrome was 4900 mg/kg/823 mg/kg [total chrome/CrR(VI)]. Remarkably, this concentration was recorded after KBR's clean-up of Qarmat Ali.

There is no dispute that Plaintiff veterans worked at the Qarmat Ali site prior to any encapsulation, clean-up, or remediation of the contaminated soils by KBR. Nor does KBR contend that the veterans ever wore Personal Protective Gear. Further, no expert disagrees with the fact that the veterans' unusual exposure, outside a traditional industrial facility, allowed for both skin and inhalation exposure. Some veterans lay in the soil or dropped food in the dust and then—after cleaning it—ate their rations.

There is no dispute that exposure to hexavalent chromium can cause acute and chronic health problems, as well as cancer. As Dr. Carson explained in his report, "A great deal is known about the toxicology of sodium dichromate and the hexavalent chromium it contains. Chromates, including sodium dichromate, have been used for hundreds of years...Many thousands of people have been exposed to them during their course of work." Ex. 4 Carson Deposition, Exhibit 456, p. 2. All the experts agree that hexavalent chromium is an acute "irritant." Defense expert Beck agrees that nose, throat and respiratory irritation are "possible symptoms of sodium dichromate exposure." Ex. 5 Beck Deposition, 109: 8-11. Ex. 3 CHPPHM at p. MCM03765 and p. MCM03649. Dr. Carson more specifically identifies these acute symptoms to include nosebleeds, bronchitis, conjunctivitis, shortness of breath, wheezing, sore

throat, sinus inflammation, and dermatitis. Ex. 4 Carson Deposition, v. 1 at 183: 25, 184:6-11. Defense expert Beck agrees that the symptoms claimed by the veterans are consistent with sodium dichromate exposure, but claims that the symptoms could have other causes. Ex. 5 Beck Depositions at 113:5. The U.S. Army concludes that even "low levels of chromium" can cause "irritative symptoms and physical findings." Ex. 3 CHPPHM at p. 00021, MCM03651.

If Plaintiff veterans' acute, irritative symptoms have resolved, Dr. Carson categorizes those symptoms as "remote" injuries, meaning they are distant in time. Ex. 4 Carson Deposition Vol. 1 at 189:18-20. Remarkably, in its Motion for Summary Judgment on statute of limitation grounds, KBR contends that acute or remote injuries from exposure occurred in 2003, and thus it is too late for the veterans to now bring a claim. KBR Defendants' Motion for Summary Judgment on the Statute of Limitations, Dkt No. 339.

In this motion, KBR does not seek to exclude Dr. Carson's testimony about chronic conditions caused by exposure to hexavalent chromium. Those conditions include airway hyper-responsiveness which could be diagnosed as asthma, chronic rhinitis and sinusitis, chronic dermatitis, and allergic asthma. Ex. 4 Carson Deposition 222-223, 224:1-5.

Finally, there is no dispute that hexavalent chromium is a carcinogen. Ex. 3 See CHPPM p. 00035, MCM03685. Dr. Carson describes how sodium dichromate increases the risk of cancer by causing a mutation at the cellular level, known as "genetic transformation," Ex. 4 Carson Deposition Vol. 1 at 237-240: 7-11 which means the cell is damaged and, according to defense expert Beck, "can replicate indefinitely." Ex. 5 Beck Deposition at 151:11-12. Genetic transformation is an "acute" injury that occurs at the time of exposure. Ex. 4 Carson Deposition, Vol. 1 at 189:20-21. Defense expert Beck recognizes the mechanism of injury to a cell called "genetic transformation," but hesitates to call that process an "injury." Ex. 5 Beck Deposition at

152-153:11-21. The veterans' acute and chronic physical injuries, as well as an increased risk of cancer, are physical injuries that can result from sodium dichromate exposure. This is not the case where an expert is creating a new diagnosis or attributing a symptom not researched to a toxin. *See, e.g., Young v. Burton*, 567 F.Supp.2d 121 (D.C.C. 2008), *aff'd*, 354 F.Appx. 432 (D.C. Cir. 2009)(physician created a new mold diagnosis that did not previously exist).

III. DR. CARSON'S EXPERT OPINIONS ARE ADMISSIBLE

Federal Rule of Evidence 702 governs the admissibility of expert testimony and codifies the relevance and reliability requirements set forth in *Daubert*, 509 U.S. 579 ("*Daubert I*") and its progeny. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 (1999). As amended, Rule 702 states that to be admissible: (1) the proffered expert testimony must assist the trier of fact to understand the evidence or to determine a fact in issue (the "relevance" prong); (2) the witness must be qualified as an expert by knowledge, skill, experience, training, or education (the "qualifications" prong); and (3) the proffered testimony must be based upon sufficient facts or data, the product of reliable principles and methods, and reliably applied to the facts of the case (the "reliability" prong). Fed. R. Evid. 702. "The court acts as 'gatekeeper' for expert testimony, using four measures when they are 'reasonable' to determine the 'reliability of expert testimony.'" *Kumho Tire Co.*, at 152.

A. Dr. Carson's Expert Opinions are Relevant.

There are three components to injury at issue in the case. Most of the veterans claim to have suffered temporary injury ("remote"). Some of the veterans claim to suffer from ongoing ill-effects of the exposure ("illness"), and all of the veterans claim to have suffered cellular level genetic transformation injury. Focusing on genetic transformation, KBR contends that genetic transformation injury, which is an "asymptomatic" cellular injury involving mutation of a cell, is

not compensable under Oregon law. The KBR defendants contend that evidence regarding genetic transformation is not relevant. The KBR defendants do not dispute that genetic transformation of cells can result from exposure to hexavalent chromium. Nor do they dispute that if there is a cellular mutation, the mutated cell functions in an abnormal way, as described by defense expert Beck, "meaning the transformation of cells so that they are no longer subject to the growth controls of normal cells and can survive, for example, indefinitely in cell culture." Ex. 5 Beck Deposition at 151:21-25.

"Expert opinion testimony is relevant if the knowledge underlying it has a valid connection to the pertinent inquiry." *Primiano v. Cook*, 598 F.3d 558, 565 (9th Cir. 2010). The testimony must "logically advance a material aspect of the proposing party's case." *Daubert v. Merrell Dow Pharm. Inc.*, 43 F.3d 1311, 1315 (9th Cir. 1995) ("*Daubert II*"). Encompassed in the determination of whether or not expert testimony is relevant is whether it is helpful to the jury. *See Mukhtar v. Cal. State Univ., Hayward*, 299 F.3d 1053, 1063 n. 7 (9th Cir. 2002). The KBR defendants do not claim that Dr. Carson's testimony is not relevant to a cellular level genetic injury. Instead, they seem to claim that genetic transformation is not an injury and, therefore, the testimony is irrelevant. The veterans claim that this physical cellular level injury is harm. Whether cellular damage can establish injury varies from state to state. The veterans have found no Oregon toxic exposure cases addressing the question. However, two cases demonstrate that cellular damage meets the requirements of an injury under Oregon law. *Doe v. American Red Cross*, 322 Or. 502, 512, 910 P.2d 364 (1996)(HIV) and *Harris v. Kissling*, 80 Or. App 5, 8-9, 721 P.2d 838 (1985)(cellular injury).

In *Doe*, the Oregon Supreme Court discussed when the statute of limitations began to run in a tainted blood case. The decedent was told in 1987 that he had received blood from the

American Red Cross that was tainted with the HIV virus during a 1985 surgery. A blood test confirmed that he was HIV-positive. Doe's widow argued in the Oregon Court of Appeals that the statute of limitations did not start to run in 1987 because there was no evidence of negligence on behalf of the American Red Cross. The Oregon Supreme Court explained that injury as used in Oregon statutes "consists of three elements: (1) harm, (2) causation, and (3) tortious conduct." *Id.* at 509 (quoting *Gaston v. Parsons*, 318 Or. 247, 255, 864 P.2d 1319 (Or. 1994)).

Although the case turned on tortious conduct, the Supreme Court never questioned whether an injury existed from the date of harm to the cells, i.e., the presence of the HIV virus without the eventual manifestation of the disease of AIDS – and without any symptoms of disease. In a footnote, the Court seems to dismiss any argument that asymptomatic cell damage is not harm. In that footnote, the Court noted that on appeal plaintiff argued for the first time that the HIV cellular damage was not a harm but "merely a threat of future harm." *Id.* at 510, n. 15. The Court rejected the threat of harm argument by pointing out that Doe had never argued that she and her husband were harmed in 1987. In other words, when Doe knew of the HIV virus, Doe was harmed, regardless of whether Doe had symptoms and the eventual disease that the virus would cause.

In *Harris*, the Oregon Court of Appeals discussed an award of damages in a legal malpractice claim. The malpractice occurred when an Rh-positive mother gave birth to an Rh-negative baby, and the hospital failed to conduct proper tests and inoculate the mother against Rh antibodies. On appeal the hospital argued that "the judge should not have submitted plaintiff's claim for damages for negligent infliction of emotional distress, because she did not plead or prove that she suffered any physical injury or any independent basis of liability." *Harris*, 80 Or.

App. at 8. The Court of Appeals held that "an irreversible physical change in [the] blood" of a mother "permanently impaired her ability to have a normal pregnancy." *Id.*

For purposes of this analysis, the veterans contend that they have suffered actual cellular injury as a result of the exposure. This is not a case where risk of future injury is the only form of injury alleged. Thus, KBR's reliance on *Lowe v. Philip Morris*, 344 Or. 403, 183 P.3d 181 (Or. 2008) is misplaced.. The plaintiffs in *Lowe* specifically alleged that Ms. Lowe and the proposed class had suffered no physical injury and were only seeking damages for medical monitoring to prevent future harm. 344 Or. at 182-83.

The case law in other jurisdictions is enlightening. See *Werlein v. U.S.* 746 F.Supp. 887, 901 (D. Minn. 1990), *vacated in part on other grounds*, 793 F. Supp. 898 (D.Minn. 1992); and *Brafford v. Susquehanna Corp.*, 586 F.Supp. 14 (D.Col. 1984). In *Werlein*, the court refused to "rule as a matter of law that plaintiffs' alleged injuries are not real simply because they are subcellular. The effect of volatile organic compounds on the human body is a subtle, complex matter. It is for the trier of fact, aided by expert testimony, to determine whether plaintiffs have suffered present harm." *Werlein*, 793 F.Supp. at 901. In *Brafford*, the court acknowledged that physical injury was a requisite to a claim and refused to dismiss a claim for chromosome damage and increased risk of cancer due to radiation exposure. *Brafford*, 586 F.Supp. 14. The defendants had characterized the "changes" as "nothing more than a subcellular expression of the increased risk." *Id.* at 17. Relying on expert testimony that the "damage has been done" and the "'trigger' of cancer change has been cocked," the court allowed the case to proceed. *Id.*

Other courts have held that state law did not support a claim for cellular change as an injury. See., e.g., *Parker v. Wellman*, 230 Fed.Appx. 878 (11th Cir. 2007)(subclinical damage does not satisfy Georgia's requirement for actual disease or impairment); *Paz v. Brush*

Engineered Materials, Inc., 555 F.3d 383 (5th Cir. 2009)(Mississippi law did not recognize cellular harm from beryllium exposure as an injury); *Dumontier v. Schlumberger Technology Corp.*, 543 F.3d 567 (9th Cir. 2008)(cellular damage is not an injury under the federal definition of an injury pursuant to the Price-Anderson Act)

In this case, Dr. Carson will testify that in all reasonable probability, the veterans' level of exposure to hexavalent chromium damaged one or more cells, causing mutation. This genetic transformation is a physical injury that increases the likelihood of cancer. No expert disputes that cancer cells are formed by genetic transformation caused by exposure to carcinogens. Dr. Beck asserts that genetic transformation does not inevitably lead to cancer, a proposition with which Dr. Carson agrees. For this reason, Dr. Carson recommends specific medical monitoring, which has been shown to detect and reduce the mortality of specific forms of cancer, which could be caused as a result of exposure to hexavalent sodium.

Dr. Carson describes three types of injuries: acute, chronic, and genetic transformation. In this case, 31 of 33 veterans suffered acute injury or chronic injuries, as well as genetic transformation injury. Two veterans have only genetic transformation injury. There should be no dispute that the 31 veterans suffered identifiable physical injuries resulting from hexavalent sodium exposure. There should be no dispute that members of the acute injury/chronic injury groups need medical monitoring due to this exposure and that they are entitled to future preventive care as a component of their damages. *See Harris v. Kissling*, 80 Or. App. at 8-9.

Of these 33 veterans, all but two have either remote injury or illness. The two plaintiffs with only genetic transformation injury are Jason Blain and Adanrolando Garcia. On the patient questionnaires they completed for Dr. Carson, Plaintiffs Blain and Garcia did not identify acute symptoms. However, both Blain and Garcia later identified acute symptoms in their depositions.

Jason Blain had respiratory issues and raw sinuses. Ex. 6 Blain Deposition at 92-93:13-20. Adan Garcia experienced rashes while he was in Iraq but did not consider them significant and did not report them to Dr. Carson. Ex. 7 Garcia Deposition at 112:1-5. The fact that Blain and Garcia did not identify these physical symptoms to Dr. Carson means that he could not diagnose their acute injuries. For these two plaintiffs, Dr. Carson will testify that exposure to Cr(VI), in reasonable medical probability, caused cellular injury. This testimony is relevant because in Oregon a cellular injury is recognized as a physical injury. For the remaining 31 plaintiffs, the genetic transformation injury is an additional component of damages, in the form of possible future consequences of physical injury

B. Dr. Carson is Highly Qualified to Offer Expert Testimony

The second tier of Rule 702 is qualifications. "Rule 702 only requires that an expert possess 'knowledge, skill, experience, training, or education' sufficient to 'assist' the trier of fact, which is 'satisfied where expert testimony advances the trier of fact's understanding to any degree.'" *Robinson v. GEICO General Ins. Co.*, 447 F.3d 1096, 1100 (8th Cir. 2006)(quoting Charles Alan Wright and Victor James Gold, *Federal Practice and Procedure: Evidence* § 6265 (1997)).

The KBR defendants do not challenge Dr. Carson's expertise to testify about most of the issues in this case, only his opinion regarding genetic transformation injury. Dr. Carson is highly qualified to testify about how toxins cause cancer, that is, the process of genetic mutation.

Dr. Carson has an impressive resume. Ex. 8 Dr. Arch I. Carson's Curriculum Vitae. He is a board certified physician in occupational medicine. As a physician, Dr. Carson has often focused his work on respiratory issues. Additionally he has a Doctor of Philosophy in Toxicology. He serves on the faculty of the University of Texas School of Public Health and has

practiced medicine and occupational medicine for twenty years. As a large part of his practice, he examines, diagnoses, and treats persons exposed to industrial chemical substances." He currently directs the residency program at UT Health Science Center and has worked also for chemical companies including Chevron Phillips Chemical Company and Exxon Chemical America. He has been appointed to governmental and professional committees, serving as the on call advisor to the City of Houston's Medical Strike Team, the President of the Texas College of Environmental and Occupational Medicine, and the American College of Medicine's Task Force on the Future of Occupational Medicine. He has published numerous articles as well as chapters in textbooks including peer-reviewed articles relating to pulmonary exposure issues. In his academic career he has studied salts similar to hexavalent chromium. For this case, he has reviewed 85 academic articles. The KBR defendants contend that because Dr. Carson is not conducting research into genetic transformation, he is not qualified to testify. The arguments Defendants use against Dr. Carson apply equally to Defendants' own witnesses. Neither witness is currently conducting research into the cellular effects of exposure to hexavalent chromium. No case law requires a witness to be conducting research in the field in which he testifies. That research has already been done. Dr. Carson and Dr. Beck can both explain how a carcinogen causes mutation of cells and how those damaged cells can cause cancer. Dr. Carson is a toxicologist who studies how toxins cause injury and disease; he is also an occupational medicine doctor, who diagnoses injury from exposure. His knowledge, skill, experience, training, or education will "advance the trier of fact's understanding." He is highly qualified to render expert testimony in this case.

C. Dr. Carson's Opinions are Reliable

The third prong of Rule 702 is reliability: the proffered testimony must be based upon

sufficient facts or data, the product of reliable principles and methods, and reliably applied to the facts of the case. Fed. R. Evid. 702. The KBR defendants challenge the reliability of Dr. Carson's opinions as it relates to genetic transformation injury, remote injury, and the need for medical monitoring.

Daubert provides a district court with the discretion necessary to close the courtroom door to 'junk science' and to admit reliable expert testimony that will aid the trier of fact. *Robinson*, 447 F.3d at 1100 (citation omitted). See also *McClellan v. I-Flow Corp.*, 710 F.Supp.2d 1092, 1101 (D.Or. 2010)(*Daubert* "was intended to exclude "junk science"- unsupported testimony or evidence cloaked in the credentials of a testifying expert - that would confuse or mislead rather than 'assist the trier of fact.'") The court acts as "gatekeeper" for expert testimony, using four measures when they are "reasonable" to determine the "reliability of expert testimony." *Kumho Tire Co.* 526 U.S. at 152.

A court may determine expert evidence to be reliable but "shaky," and if that is the conclusion, then, "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert*, 509 U.S. at 595. In assessing the admissibility of expert testimony, the issue is whether the evidence is based on an assertion that is grounded in the methods of science. *Id.* at 590. The focus must be on principles and methodology. *Id.* at 596. See *McClellan* at 1110-1112 (explaining that the grounds for an expert's testimony must be good" but not "perfect," and that a *Daubert* motion does not require proof of the correctness of the expert, just support for the methodology of the expert).

As a basis for all his opinions, Dr. Carson used accepted scientific methodology, including design and analysis of a specific questionnaire to analyze the history and symptoms of

each veteran; medical exams of 150 injured veterans who visited Qarmat Ali, including each veteran in this case; reviewed data related to the contaminated site; analyzed blood samples of persons at the site; reviewed 85 relevant articles in peer-reviewed journals; and analyzed exposures based on the best available evidence.

Dr. Carson designed questionnaires to determine exposure and diagnose relevant symptoms and conditions resulting from hexavalent chromium exposure. He discussed each form with each soldier "in detail." Ex. 4 Carson Deposition at 125:20-25. He also asked 150 veterans (including veterans from other states) the length of time they were at the site and discussed their exposure with them. He developed a numerical system to determine "whether or not the relationship between chromium exposure and symptoms or illnesses was plausible." Ex. 4 Carson Deposition 108:5-7. He further reviewed descriptions of the contamination of the site as well as summaries of lab tests reporting elevated levels of hexavalent chromium in workers at Qarmat Ali. Ex. 4 Carson Deposition at 300:1-3. He then categorized the workers' exposure into four categories: low, mild, moderate, and severe. He determined that a person with low exposure had been on site less than 8 hours; mild exposure between 8 to 80 hours; moderate exposure between 80 to 200 hours; and severe exposure more than 200 hours. Ex. 4 Carson Deposition at 174:4-11.

1. Dr. Carson's Opinions Regarding Genetic Transformation Injury Are Reliable

Defendant attacks the reliability of Dr. Carson's testimony about genetic transformation of cells, the remote injury suffered by veterans, and the need for medical monitoring. There should be no dispute that hexavalent chromium is a carcinogen. International Agency for Research on Scient, (1999-11-05) *Volume 49; Chromium, Nickel, and Welding* (1990); and Ex. 3 CHPPM, p. 00035, MCM03685. Nor should there be any dispute that carcinogens cause cancer by mutating

cells. Ex. 5 Beck Deposition at 151:11-12. Defendants contend that Dr. Carson's opinion regarding genetic transformation resulting from exposure to hexavalent chromium is unreliable because it is not based on a specific dose. Defendants divide this argument into two sections of their brief, but the basic premise is the same.

a. Dr. Carson Estimated "Dose" by Determining "Degree of Exposure."

A “[l]ack of certainty is not, for a qualified expert, the same thing as guesswork.” *McClellan*, 710 F. Supp. 2d at 1101 (quoting *Primiano*, 598 F.3d at 565). While ‘precise information concerning the exposure necessary to cause specific harm [is] beneficial, such evidence is not always available, or necessary, to demonstrate that a substance is toxic.’” See *Clausen v. M/V NEW CARISSA*, 339 F.3d 1049, 10559 (9th Cir. 2003) (quoting *Westberry v. GGAB*, 178 F.3d 257, 264 (4th Cir. 1999)); *McClellan*, 710 F. Supp. 2d at 1111 (quoting *Domingo v. T.K.*, 289 F.3d 600, 607 (9th Cir. 2002) (“While plaintiffs’ experts cannot identify the precise threshold dose of bupivacaine or the length of exposure that triggers irreparable chondrocyte damage, ‘*Daubert* does not require that every aspect of a theory of medical causation be supported by research on the identical point’”).

Other jurisdictions considering exposure claims also conclude that precise information is not necessary to establish causation. See *Heller v. Shaw Indust., Inc.*, 167 F.3d 146, 157 (3rd Cir. 1999) (“[E]ven absent hard evidence of the level of exposure to the chemical in question, a medical expert could offer an opinion that the chemical caused plaintiff's illness.”); *Wright v. Willamette Indus., Inc.*, 91 F.3d 1105, 1107 (8th Cir. 1996) (noting that plaintiffs need not show a “mathematically precise table equating levels of exposure with levels of harm.”); *In re Avandia Mktg., Sales Prac. & Prod. Liab. Litig.*, 2011 WL 13576 (E.D.Pa. Jan. 4, 2011) (denying motion to exclude plaintiffs’ experts’ opinion about causal connection between Avandia and myocardial

infarction without discussion of toxic dose); *Bartlett v. Mutual Pharm. Co., Inc.*, 760 F. Supp. 2d 220 (D.N.H. 2011) (denying motion for judgment as a matter of law because plaintiff presented sufficient evidence that drug's risks outweighed its benefits without discussion of toxic dose); *In re Fosamax Prod. Liab. Litig.*, 645 F. Supp. 2d 164 (S.D.N.Y. 2009) (denying motion to exclude plaintiffs' experts' opinion that drug can cause osteonecrosis of the jaw without requiring demonstration of toxic dose); *In re Neurontin Mktg., Sales Prac., & Prod. Liab. Litig.*, 612 F. Supp. 2d 116 (D. Mass. 2009) (denying motion to exclude plaintiffs' experts' opinion that Neurontin can increase risk of suicide without determination of dose-response relationship); *In re: Zicam Cold Remedy Mktg., Sales Prac., & Prod. Liab. Litig.*, 797 F. Supp. 2d 940, 946 (D. Ariz. 2011) (concluding that "to establish general causation, plaintiffs need not prove a toxic dosage of Zicam. Instead, plaintiffs must demonstrate Zicam "is toxic to humans given substantial exposure" and may do so with qualitative rather than quantitative analysis).

KBR's spoliation of the evidence also refutes its "dose" contention. A federal court has the inherent discretionary power to make appropriate evidentiary rulings in response to the destruction of relevant evidence. *Gloyer v. BIC Corp.*, 6 F.3d 1318, 1329 (9th Cir. 1993). "Daubert counsels against rigid formulations of reliability and, instead, requires the court to carefully examine plaintiffs' experts' methodologies as applied to the specific facts presented." *McClellan, McClellan v. I-Flow Corp.*, 710 F. Supp. 2d 1092, 1138 (D. Or. 2010). KBR committed spoliation by failing to convey its knowledge of the sodium dichromate contamination while soldiers were being exposed on site for months and by implementing remediation efforts before testing the site. These two acts had the practical effect of preventing soldiers from being tested before remediation efforts would skew the test results, as sodium dichromate is flushed

through the body and becomes untraceable fairly quickly. Had it not been for KBR's spoliation, the Plaintiff veterans would have been able to establish dose with mathematical precision.

KBR took no air samples before altering the site, and the air samples they took are tainted with problems so severe as to make them unreliable. KBR took insufficient soil samples as well. The only sampling of soil showed extremely high concentrations of chemicals. The reported blood tests of workers at the site confirmed that exposures were extreme. Just as experts recreate accident scenes, experts in this case are modeling exposures based on the best available data. *See In re: Zicam* at 945 (citation omitted) ("while 'precise information concerning the exposure necessary to cause specific harm is beneficial, such evidence is not always available, or necessary, to demonstrate that a substance is toxic.'") The 700 bags recovered at the site and the physical descriptions of deep orange powder demonstrate that the exposures were extreme.

b. Dr. Carson's Opinion is Scientifically Grounded and Reliable

Dr. Carson's opinion that genetic transformation is not a dose dependent injury is supported by the literature. Dr. Carson's opinion is consistent with studies by the European Commission, which concluded, "For mutagenicity and carcinogenicity, no threshold below which there would be no risk to human health can be identified for these endpoints."¹ His opinion, that that there is **not** a No Observed Adverse Effects Level, is based on studies published in peer-reviewed literature.² As explained by the European Commission, "In view of the genotoxic and

¹ European Commission, Institute for Health and Consumer Protection (2005) Report of the UK Rapporteur. Chromium trioxide, sodium chromate, sodium dichromate, ammonium dichromate and potassium dichromate: Summary risk assessment report. Special Publication 1.05.16, pp. 3-4.

² *Id.* at pp. 26-27. "Conclusion (iii) is reached for mutagenicity and carcinogenicity because no threshold below which there would be no risk to human health can be identified for these endpoints." *See also* Michaels D, Lurie P, Monforton C. Lung cancer mortality in the German chromate industry, 1958 to 1998 (letter). (2006) *J Occup Environ Med.* 48(1 0): 995-998 (explaining that OSHA has rejected data suggesting a "possible threshold effect" of Cr(VI) exposure on lung cancer); and van Wijngaarden E, Mundt KA, Luippold RS. Evaluation of the exposure-response relationship of lung cancer mortality and occupational exposure to hexavalent chromium based on published epidemiological data. (2004) *Nonlinearity in Biology, Toxicology, and Medicine.* 2: 27-34 European

carcinogenic properties of these Cr(VI) compounds, there are concerns for all exposure scenarios."

Dr. Carson's conclusions meet the standards required by *Daubert*. His opinions are based on review and analysis of scientific literature, which supports the conclusion that hexavalent chromium is genotoxic, a conclusion supported by all parties. That there is no threshold level for the toxic effect has been tested by scientists and reported in peer-reviewed literature. His conclusions are also based on his scientific methodology used by toxicologists regarding the effects of carcinogens on cells.

Defendants cite two cases to try to exclude Dr. Carson's testimony. Those cases are not on point. *Burleson* involved a prison inmate with throat and lung cancer. *Burleson v. Texas Dep't of Criminal Justice*, 393 F.3d 577(5th Cir. 2004). While it was agreed that thorium dioxide was a carcinogen, the only studies relied upon involved Thoroplast, which contains a higher percentage of thorium dioxide than the toxin at issue. Further, the studies of Thoroplast found causation of liver, spleen and bone cancer, not throat and lung cancer, which the Plaintiff had. The Fifth Circuit determined that the fact that no studies linked thorium dioxide to the type of cancer claimed meant the testimony was unreliable. While the Fifth Circuit discusses the dose threshold, the case does not turn on that issue. Further, the literature in this case is specific to hexavalent dichromate and supports the conclusion that there is no safe level of the toxin and that genetic mutation occurs at any exposure.

The KBR defendants continue to rely on *Abuan v. General Elec. Co.*, 3 F.3d 329 (9th Cir. 1993), which holds that in order to prove a future injury from an exposure to PCBs, the party must have received a threshold dose of the toxin. In that case, the expert's "cursory" opinion

Commission, *supra*, at pp. 3-4(rejecting a threshold mechanism for carcinogenicity of exposure to Cr(VI)).

described the toxic effect of PCBs in a general way. No plaintiff had existing injuries. The *Abuan* expert concluded that plaintiffs had an increased risk of future injury and therefore needed medical monitoring. The Ninth Circuit concluded that in order to make a claim for a future injury, the plaintiff must show that the malady must be reasonably likely to occur. *Abuan* at 334. For PCBs, a threshold dose was necessary to show probable future injury. *Abuan* does not control the present case because Oregon applies a bright-line physical injury rule. All of the plaintiffs claim physical injury. While two have only genetic component, the remaining 32 have ongoing illness or previous injury that has since resolved.

2. Dr. Carson's testimony regarding remote injuries is reliable.

KBR contends that Dr. Carson's opinion that the Veterans sustained a remote exposure injury is "meaningless" because it is not aware of what injuries are encompassed by a remote exposure injury. Defs' Mem. in Supp. at 8-9. As demonstrated during Dr. Carson's deposition, however, KBR knows exactly what injuries are encompassed by remote exposure injuries:

QUESTION: "Remote" here refers to --

ANSWER: Long ago.

QUESTION: -- time --

ANSWER: That's correct.

QUESTION: -- not geography?

ANSWER: That's correct.

Pls' Ex. 25, Carson Dep. p. 137. Also demonstrative of the fact that KBR is well aware of the Veterans' remote injuries, KBR moved for summary judgment premised upon its assertion that the Veterans knew that they were injured in 2003. See Defs' Mem. in Supp. at 1-8, Doc. No. 338.

Further demonstrating that it knows exactly what remote exposure refers to, KBR asserts that Dr. Carson's opinion that the Veterans experienced various injuries typically associated with acute sodium dichromate exposure is not reliable because it is only supported by individual Veteran's statements to Dr. Carson. Defs' Mem. in Supp. at 10 (*citing In re TMI Litig.*, 193 F.3d 613, 698 (3rd Cir. 1999)). KBR's assertion is inaccurate and ignores the multiple bases supporting Dr. Carson's opinion that the Veterans experienced a remote exposure injury.

For example, Dr. Herman Gibb supports Dr. Carson's opinion and opines that the Veterans' onsite injuries were caused by sodium dichromate exposure. Pls' Ex. 24, Gibb Rep. pp. 26-28. KBR has no basis to doubt Dr. Gibb's support of Dr. Carson's opinion, as even KBR recognizes that Dr. Gibb is "one of the more experienced epidemiologists in chromate exposure in the country." Pls' Ex. 26, Gibb Dep. p. 245.

Similarly, KBR makes no attempt to confront the substantial body of evidence relied upon by Dr. Gibb and Dr. Carson that demonstrates that the Veterans' onsite injuries are attributable to sodium dichromate exposure. Documents relied upon by Dr. Carson and Dr. Gibb support their opinion and provide:

- Based on visual observations, large areas of the eastern side of the WTP have been impacted by releases of aqueous solutions of Sodium Dichromate in and around the chemical injection building.

In addition, a sump, reported to have previously contained "orange water" was located in this area. KBR personnel reportedly pumped the orange water from this sump. Yellow stains are present on the walls of the sump.

Yellow stained soils extend outside the WTP fence. To the north of the intake canal on the eastern side of the WTP road, immediately south of the entrance gate on the east side of the WTP. Yellow crystalline material was observed on the walls and floors of the pump building located to the east of the chemical injection building.

High levels of Chromium, Selenium, and Zinc have been determined. Chromium and Zinc were the resultants from use of chemicals Sodium Dichromate and Zinc Sulfate, for corrosion inhibitors. Pls' Ex. 22, Carson Supp. Rep. at 7; *see also* Pls' Ex. 8, Aug. 11, 2003 Lee Email.

- Visual assessments by KBR Construction and Environmental staff of surface soil outside of buildings within the WTP and areas outside the WTP fence have identified the following contaminated areas.

Yellow Stained Soil – Sodium Dichromate

- Adjacent to the chemical injection building and extending north and east to the WTP fence.
- Under the KBR office trailer and two SOC trailers.
- Under the thin gravel layer on the KBR office parking area and Halliburton office and equipment area.
- Adjacent to and extending approximately 50' west of the chemical injection building.
- North of the intake canal east of the WTP (200' x 200')
- Two orange-red stained areas were observed within this area suggesting the presence of crystalline Sodium dichromate.
- Any area covering 100' x 10' in an area south of the chlorination building and the east-west road on the south boundary of the facility.
- Cement drainage ditch extending from east side of chemical injection building to fence on east boundary of WTP.
- Unlined evaporation pond of approximately 3 acres located about 50' east of east fence.

One chemical storage building contains several broken bags of an orange material that appears to be pure sodium dichromate. Pls' Ex. 22, Carson Supp. Rep. pp. 7-8; *see also* Pls' Ex. 10, Aug. 3, 2003 Project Rio Qarmat Ali Rep.

- Around July realized that Sodium Dichromate was in more places than supposed to be, basically open to atmosphere, scattered all over the plant. Sodium Dichromate has penetrated the soil, dogged [sic] up to 4 feet and found Sodium Dichromate contamination. Pls' Ex. 22, Carson Supp. Rep. p. 8; *see also* Pls' Ex. 11, Oct. 2, 2003 Meeting Min.
- Water Treatment Plant – We did a walk around in full PPE, we saw quite a bit of contaminated soil. Pls' Ex. 22, Carson Supp. Rep. p. 8; *see also* Pls' Ex. 12, Oct. 5, 2003 Bagnoche email.
- The toxic chemical had contaminated the entire plant. Pls' Ex. 22, Carson Supp. Rep. p. 9; *see also* Pls' Ex. 13 KBRS Self-Eval.

In addition to these documents, Dr. Carson's opinion is buttressed with pictures of soldiers virtually standing on top of hundreds of open bags of sodium dichromate and Plaintiffs' confirmation of being showered, unprotected with discolored dust and soil as it blew in the open wind. Pls' Ex. 22, Carson Supp. Rep. p. 9; *see also* Pls' Ex. 14, Photographs.

Onsite injuries and blood tests also corroborate Dr. Gibb and Dr. Carson's opinion.

Documents relied upon by Dr. Carson support his opinion and provide:

- Almost 60% of people now exhibit symptoms. Pls' Ex. 22, Carson Supp. Rep. p. 9; *see also* Pls' Ex. 15, Aug. 8, 2003 Meeting Min.
- We began to have people come to us complaining that they had the symptoms listed on the MSDS for Sodium Dichromate. Several have stated that they have had very sore noses with some slight bleeding and others that describe "ulcers" in their noses. Pls' Ex. 22, Carson Supp. Rep. p. 10; *see also* Pls' Ex. 16, Aug. 25, 2003 VanOstrand email.
- We have received confirmation that our people have been exposed to the chromium at the WTP and some of the test results indicate they are at elevated levels (i.e. 117 Vs N < 10). Pls' Ex. 22, Carson Supp. Rep. p. 10; *see also* Pls' Ex. 17, Sept. 9, 2003 Adams' Email.
- While chrome results showed that level of blood Chrome is high, some people tested 4 times higher while others up to 14 times. Pls' Ex. 22, Carson Supp. Rep. p. 10; Pls' Ex. 18, Sept. 16, 2003 Meeting Min.
- KBR blood draws continue to show signs of Chromium VI staining. Pls' Ex. 22, Carson Supp. Rep. p. 10; *see also* Pls' Ex. 19, Sept. 26, 2003 Jerry Balcom email.
- Urine and blood sample showed elevated levels of Chromium meaning there was a significant exposure. Pls' Ex. 22, Carson Supp. Rep. p. 10; *see also* Pls' Ex. 11, Oct. 2, 2003 Meeting Min.
- We have had a few (5) soldiers go on sick call for exposure to chemicals. Pls' Ex. 22, Carson Supp. Rep. p. 11; *see also* Pls' Ex. 20, Sept. 17, 2003 Basra Water Treatment Plant Doc.
- Onsite medical personnel noticing that men stationed at Qarmat Ali were experiencing nosebleeds and breathing difficulties. Pls' Ex. 22, Carson Supp. Rep. p. 11; *see also* Pls' Ex. 21, Black Dep. pp. 22-23.

The above-cited evidence, Dr. Gibb's opinion, and the fact that it cannot be seriously disputed that sodium dichromate exposure can cause the acute irritative symptoms visited upon the Veterans support Dr. Carson's conclusion that:

Because of the extremely noxious nature of sodium dichromate and the obvious prevalence of . . . contamination at Qarmat Ali, it cannot be seriously disputed that the below-discussed symptoms typically associated with sodium dichromate exposure documented by National Guard and RAF Veterans were, in fact, to a reasonable degree of medical certainty caused by the extensive sodium dichromate

contamination at Qarmat Ali and are demonstrative of an injury to the Veterans, including to their cellular DNA.

Pls' Ex. 22, Carson Supp. Rep. p. 9.

Finally, KBR's cited case of *In re TMI Litigation* does not impugn Dr. Carson's opinion. *In re TMI Litigation* excluded an expert report because the expert neither reviewed medical records nor examined patients. 193 F.3d at 698. *In re TMI Litigation*, however, indicated that the expert report at issue would have been admissible had the expert "either reviewed her study subjects' medical and hospital records or examined the subjects herself." *Id.* Thus, *In re TMI Litigation* supports the admission of Dr. Carson's opinion because he not only examined the Veterans but he also reviewed all medical records. Pls' Ex. 25, Carson Dep. pp. 71, 99, 220.

Of equal importance, KBR fails to alert the Court of the substantial body of authority that indicates that the Federal Rules permit a medical expert to rely upon the statements of plaintiffs. *See e.g. Pickel v. Union Pac. R.R. Co.*, 2006 WL 4941836 * 1 (C.D. Cal. July 18, 2006) ("An expert witness is free to rely on statements of a patient in reaching conclusions about the nature, extent, cause, and diagnosis of a patient's condition") (citing Fed. R. Evid. 703; *Westfield Ins. Co. v. Harris*, 134 F.3d 608, 612 (4th Cir. 1998); *Cooper v. Carl A. Nelson & Co.*, 211 F.3d 1008, 1020 (7th Cir. 2000)). KBR's position is also contradicted by the Advisory Comment to Rule 703, which provides:

Thus a physician in his own practice bases his diagnosis on information from numerous sources and of considerable variety, including statements by patients and relatives.

Fed. R. 703, ACN; *Peteet v. Dow Chem. Co.*, 868 F.2d 1428, 1432 (5th Cir. 1989).

KBR neither addresses the factors that support Dr. Carson's conclusion that the Veterans' onsite injuries were caused by sodium dichromate nor case law that demonstrates that Dr. Carson

far exceeded the requirements necessary to support his conclusion. Accordingly, KBR's Motion to Exclude should be denied.

3. Dr. Carson's opinion regarding future medical monitoring is reliable.

Possible future expenses are recoverable in Oregon. *Harris v. Kissling*, 80 Or. App. at 8-9. Those expenses can include the cost medical monitoring when there is a physical injury. *See Lowe*, 344 Or. at 408, and 408 fn. 5 (explaining that "costs for medical care to determine the extent of harm" are recoverable on "proper proof" and distinguishing a case with a medical monitoring recovery in which physical injury was present.)

Costs of medical monitoring for a cellular injury are recoverable. *See Werlein v. U.S.* 746 F.Supp. 887 (D. Minn. 1990), *vacated in part on other grounds*, 793 F. Supp. 898 (D.Minn. 1992). For a robust review of caselaw involving medical monitoring, *see Bocook v. Ashland Oil, Inc.*, 819 F.Supp. 530 (S.D.W.Va. 1993)(holding that Kentucky, like Oregon, requires some proof of physical injury for damages for medical monitoring to be recovered).

In this case, Dr. Carson has recommended biannual physical examinations, biannual CAT scans and biannual sputum pathology screening. These are all tests to detect respiratory tract disease. Defendant errs in stating that Dr. Carson admitted "that he [wa]s not offering his monitoring opinion to a reasonable medical certainty." Def. Motion, p. 13. Dr. Carson testified that he recommended medical monitoring for all the veterans exposed at Qarmat Ali. When Defense attorneys asked Dr. Carson if there were a group of the plaintiffs with a risk of lung cancer like that of a person who smoked 30-packs of cigarettes a year, Dr. Carson replied a person who had spent more than 80 hours at Qarmat Ali. Ex. 4 Carson Deposition at 317-318: 19-1. When asked whether this 80-hour answer was an opinion "to a reasonable medical certainty," Dr. Carson stated no. He went on to restate his original proposition, that everyone

exposed to Cr(VI) at Qarmat Ali be screened. Ex. 4 Carson Deposition at 318: 4-7. Dr. Carson was never asked whether "a reasonable physician would prescribe for the plaintiff[s] a monitoring regime different from the one that would be prescribed had the exposure never occurred." *Allgood v. General Motors Corp.*, 2006 WL 2669337, at 26 (S.D. Ind. Sept. 18, 2006). Clearly, to such a question, his report gives an unequivocal yes.

IV. CONCLUSION

For the reasons outlined above, KBR's Motion to Exclude the reliable and relevant expert testimony of Dr. Chip Carson should be denied.

Dated this 22nd day of May, 2012



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